

Fig. 1

BPSK AWGN CHANNEL COPY

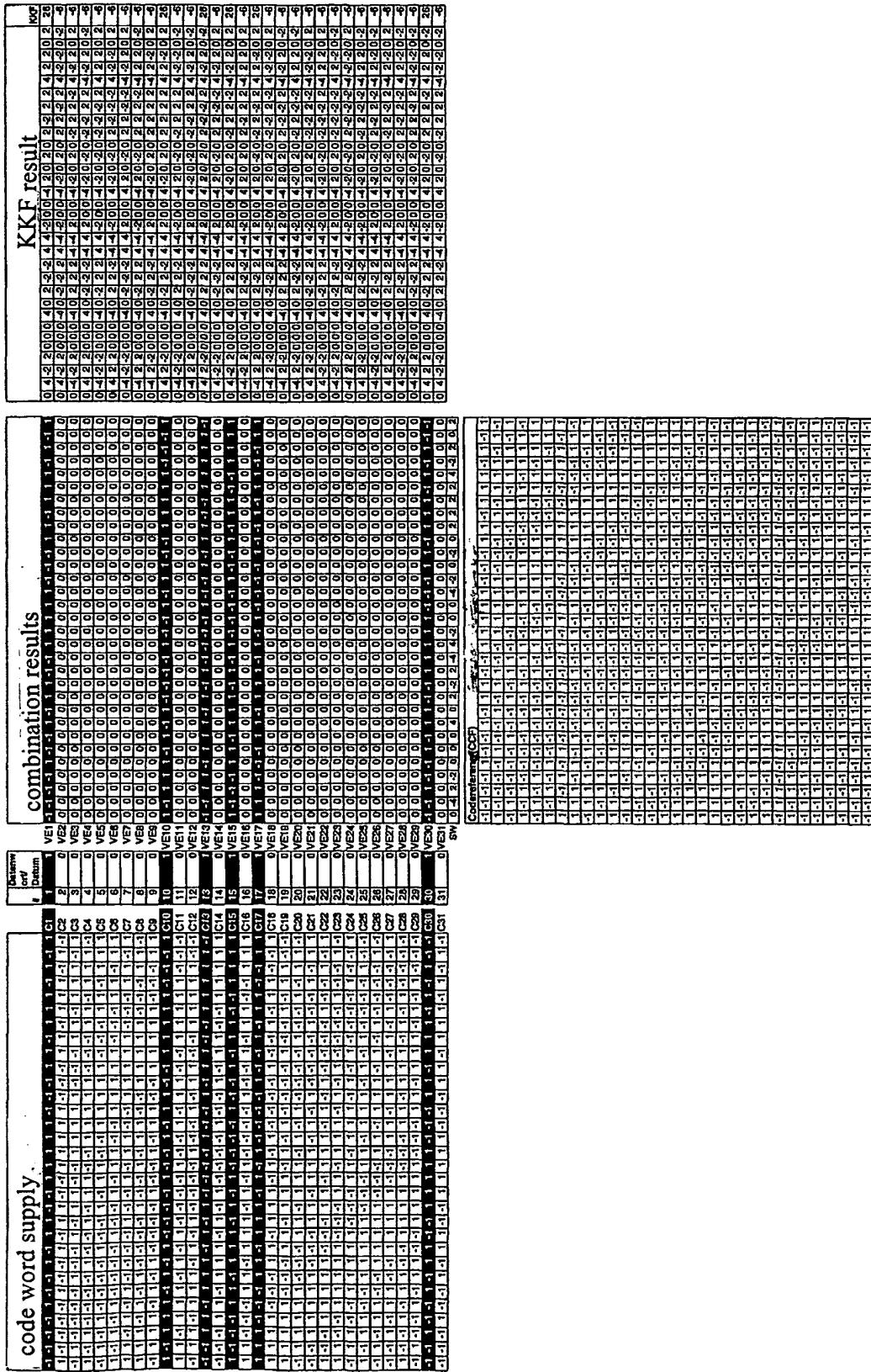


Fig. 2a

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

KKF function (discrete)

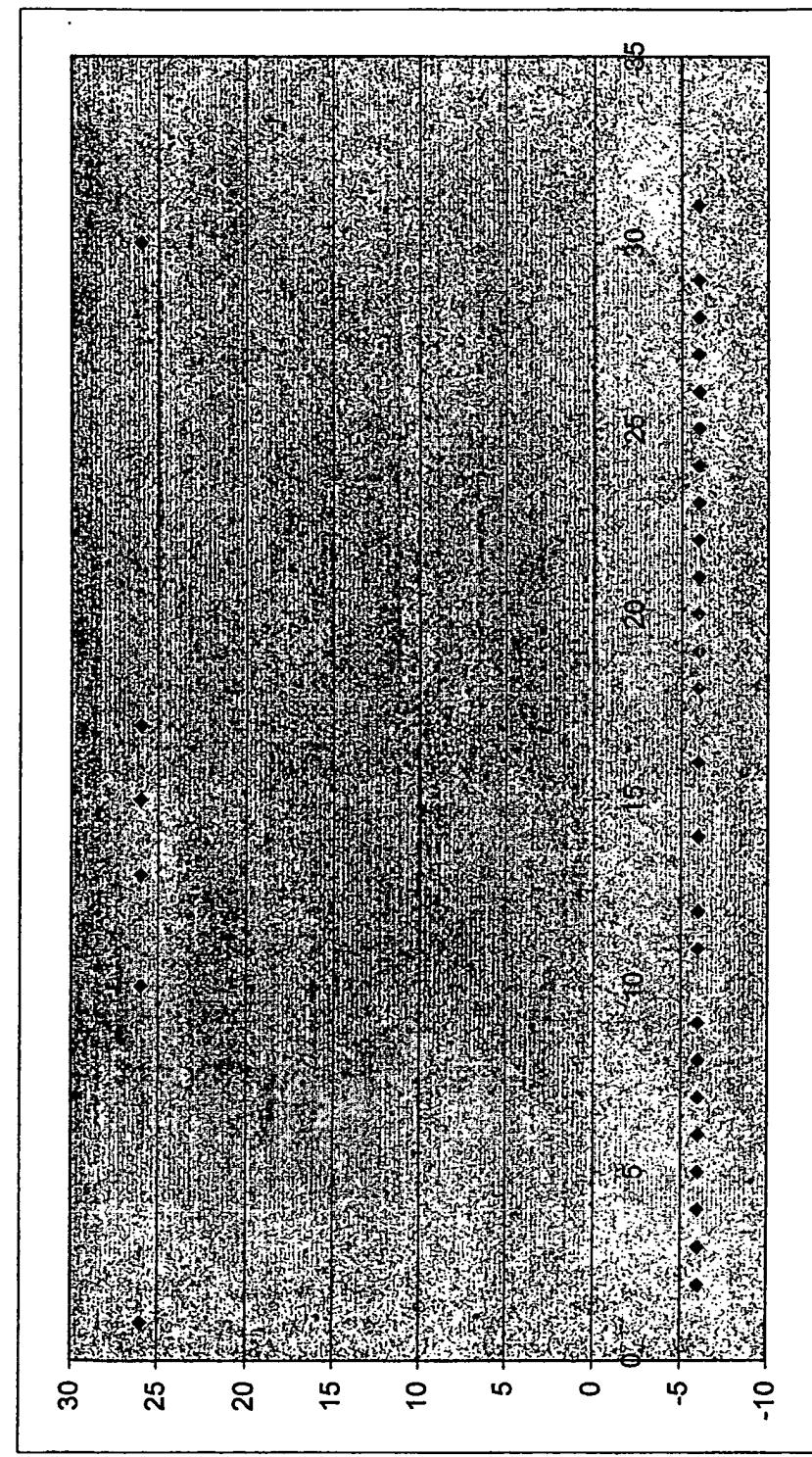


Fig. 2b

| code word supply | | | | | | | | | | | | | | | | combination results | | | | | | | | | | | | | | | | KKF result | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|--|----|--|--|--|--|--|--|--|--|--|--|--|--|--|---------------------|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|------------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|------|--|
| data new column | | C1 | | | | | | | | | | | | | | VE1 | | VE2 | | VE3 | | VE4 | | VE5 | | VE6 | | VE7 | | VE8 | | VE9 | | VE10 | | VE11 | | VE12 | | VE13 | | VE14 | | VE15 | | VE16 | | VE17 | | VE18 | | VE19 | | VE20 | | VE21 | | VE22 | | VE23 | | VE24 | | VE25 | | VE26 | | VE27 | | VE28 | | VE29 | | VE30 | | VE31 | | VE32 | | VE33 | | VE34 | | VE35 | | VE36 | | VE37 | | VE38 | | VE39 | | VE40 | | VE41 | | VE42 | | VE43 | | VE44 | | VE45 | | VE46 | | VE47 | | VE48 | | VE49 | | VE50 | |
| C2 | | C1 | | | | | | | | | | | | | | VE1 | | VE2 | | VE3 | | VE4 | | VE5 | | VE6 | | VE7 | | VE8 | | VE9 | | VE10 | | VE11 | | VE12 | | VE13 | | VE14 | | VE15 | | VE16 | | VE17 | | VE18 | | VE19 | | VE20 | | VE21 | | VE22 | | VE23 | | VE24 | | VE25 | | VE26 | | VE27 | | VE28 | | VE29 | | VE30 | | VE31 | | VE32 | | VE33 | | VE34 | | VE35 | | VE36 | | VE37 | | VE38 | | VE39 | | VE40 | | VE41 | | VE42 | | VE43 | | VE44 | | VE45 | | VE46 | | VE47 | | VE48 | | VE49 | | VE50 | |
| C3 | | C1 | | | | | | | | | | | | | | VE1 | | VE2 | | VE3 | | VE4 | | VE5 | | VE6 | | VE7 | | VE8 | | VE9 | | VE10 | | VE11 | | VE12 | | VE13 | | VE14 | | VE15 | | VE16 | | VE17 | | VE18 | | VE19 | | VE20 | | VE21 | | VE22 | | VE23 | | VE24 | | VE25 | | VE26 | | VE27 | | VE28 | | VE29 | | VE30 | | VE31 | | VE32 | | VE33 | | VE34 | | VE35 | | VE36 | | VE37 | | VE38 | | VE39 | | VE40 | | VE41 | | VE42 | | VE43 | | VE44 | | VE45 | | VE46 | | VE47 | | VE48 | | VE49 | | VE50 | |
| C4 | | C1 | | | | | | | | | | | | | | VE1 | | VE2 | | VE3 | | VE4 | | VE5 | | VE6 | | VE7 | | VE8 | | VE9 | | VE10 | | VE11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

KKF function (discrete)

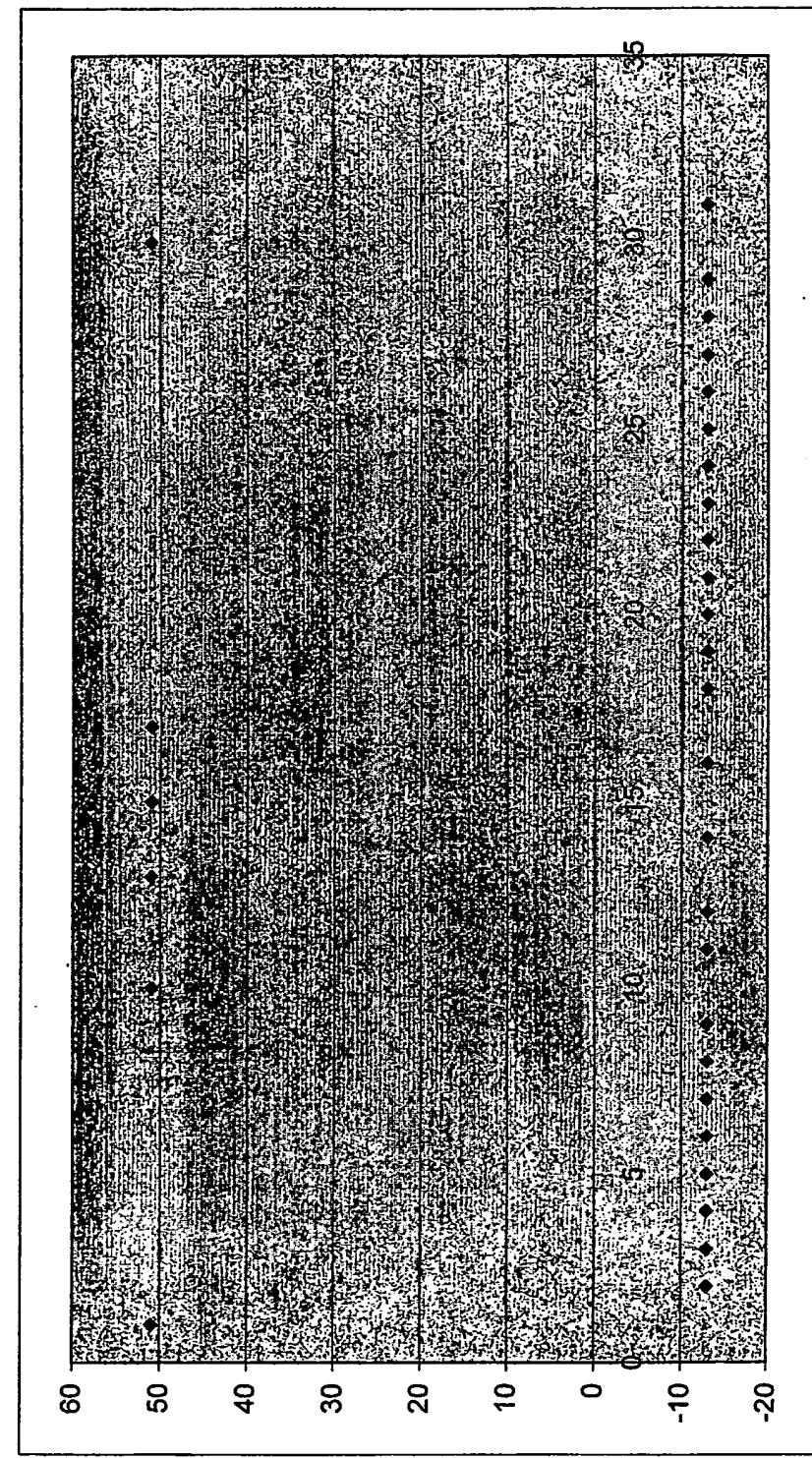


Fig. 3b

| code word supply | | Code reference (CR) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---------------|---------------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Detrim new | Detrim old | YES1 | YES2 | YES3 | YES4 | YES5 | YES6 | YES7 | YES8 | YES9 | YES10 | YES11 | YES12 | YES13 | YES14 | YES15 | YES16 | YES17 | YES18 | YES19 | YES20 | YES21 | YES22 | YES23 | YES24 | YES25 | YES26 | YES27 | YES28 | YES29 | YES30 | YES31 |
| KKF result | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YES1 | YES2 | YES3 | YES4 | YES5 | YES6 | YES7 | YES8 | YES9 | YES10 | YES11 | YES12 | YES13 | YES14 | YES15 | YES16 | YES17 | YES18 | YES19 | YES20 | YES21 | YES22 | YES23 | YES24 | YES25 | YES26 | YES27 | YES28 | YES29 | YES30 | YES31 | | |
| combination results | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| YES1 | YES2 | YES3 | YES4 | YES5 | YES6 | YES7 | YES8 | YES9 | YES10 | YES11 | YES12 | YES13 | YES14 | YES15 | YES16 | YES17 | YES18 | YES19 | YES20 | YES21 | YES22 | YES23 | YES24 | YES25 | YES26 | YES27 | YES28 | YES29 | YES30 | YES31 | | |

Fig. 4a

KKF function (discrete)

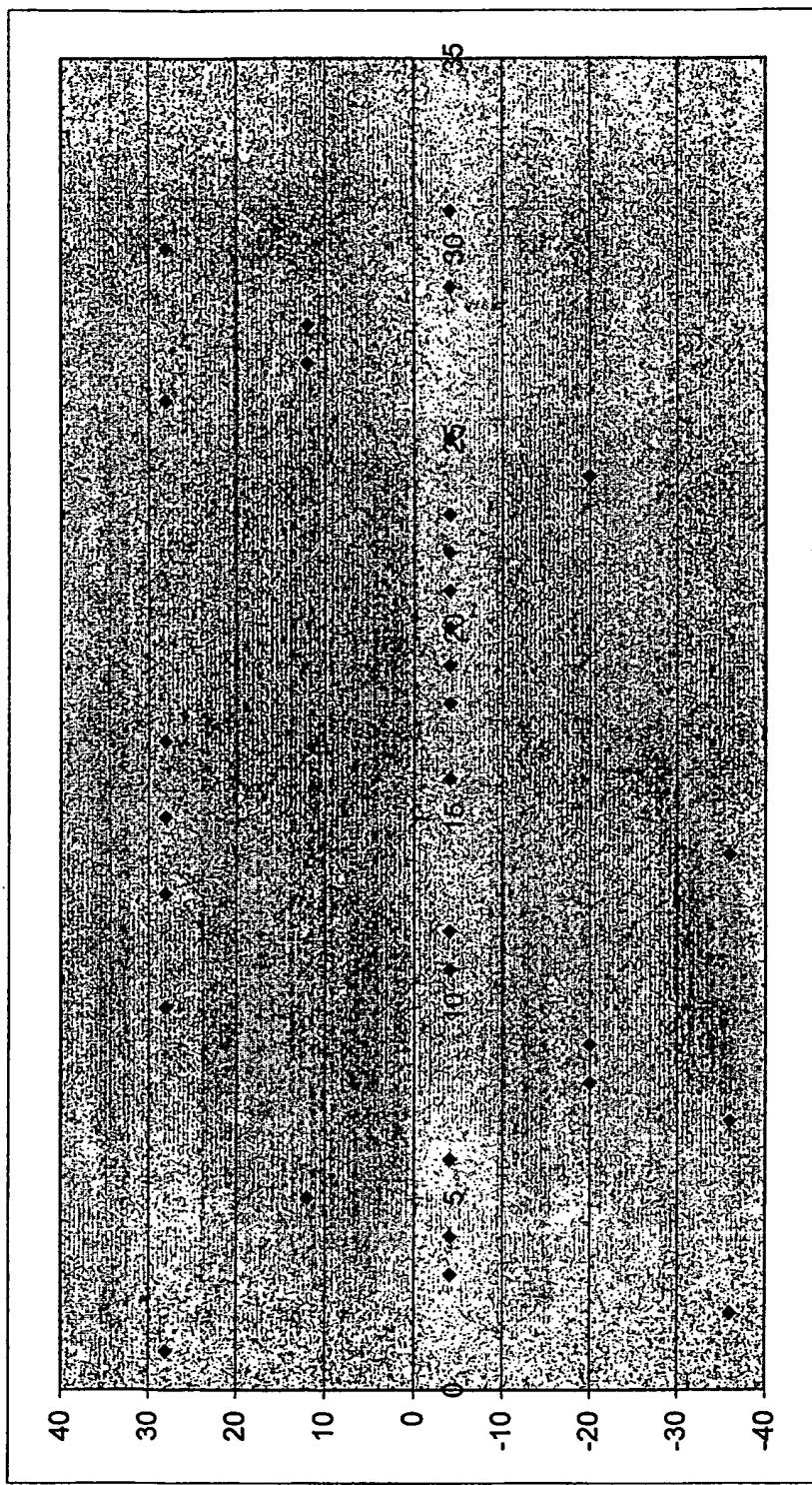
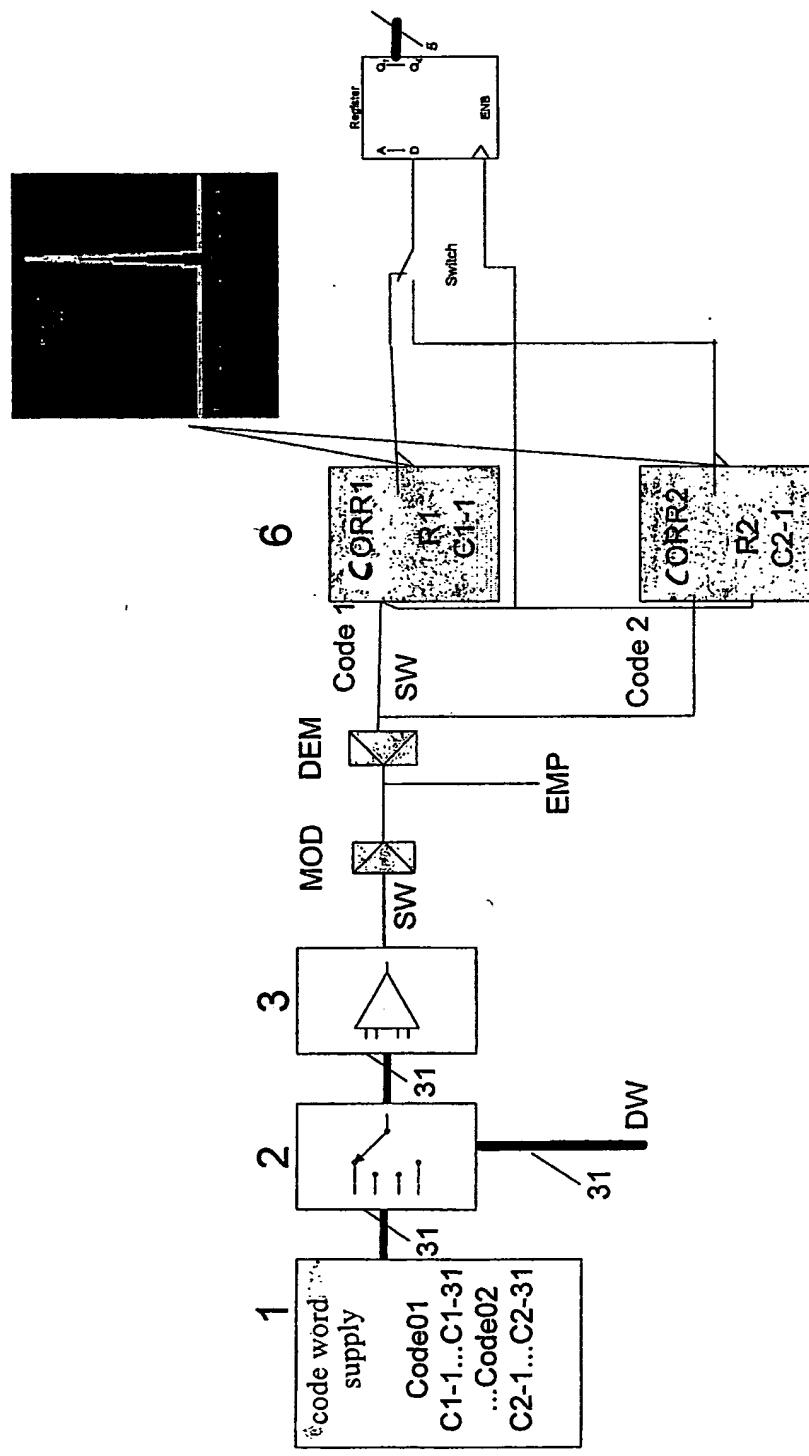


Fig. 4b

$$\begin{aligned}
 a(n) &= 0, 1, 1, 1, 1, 0, \dots \\
 &\quad 2^1 2^0 2^1 2^0 2^1 2^0 \mod 2 \\
 a'(n) &= 1, 3, 2, \dots \\
 &\quad 4^0 4^0 4^0 \mod 4
 \end{aligned}$$

Fig. 5

Fig. 6



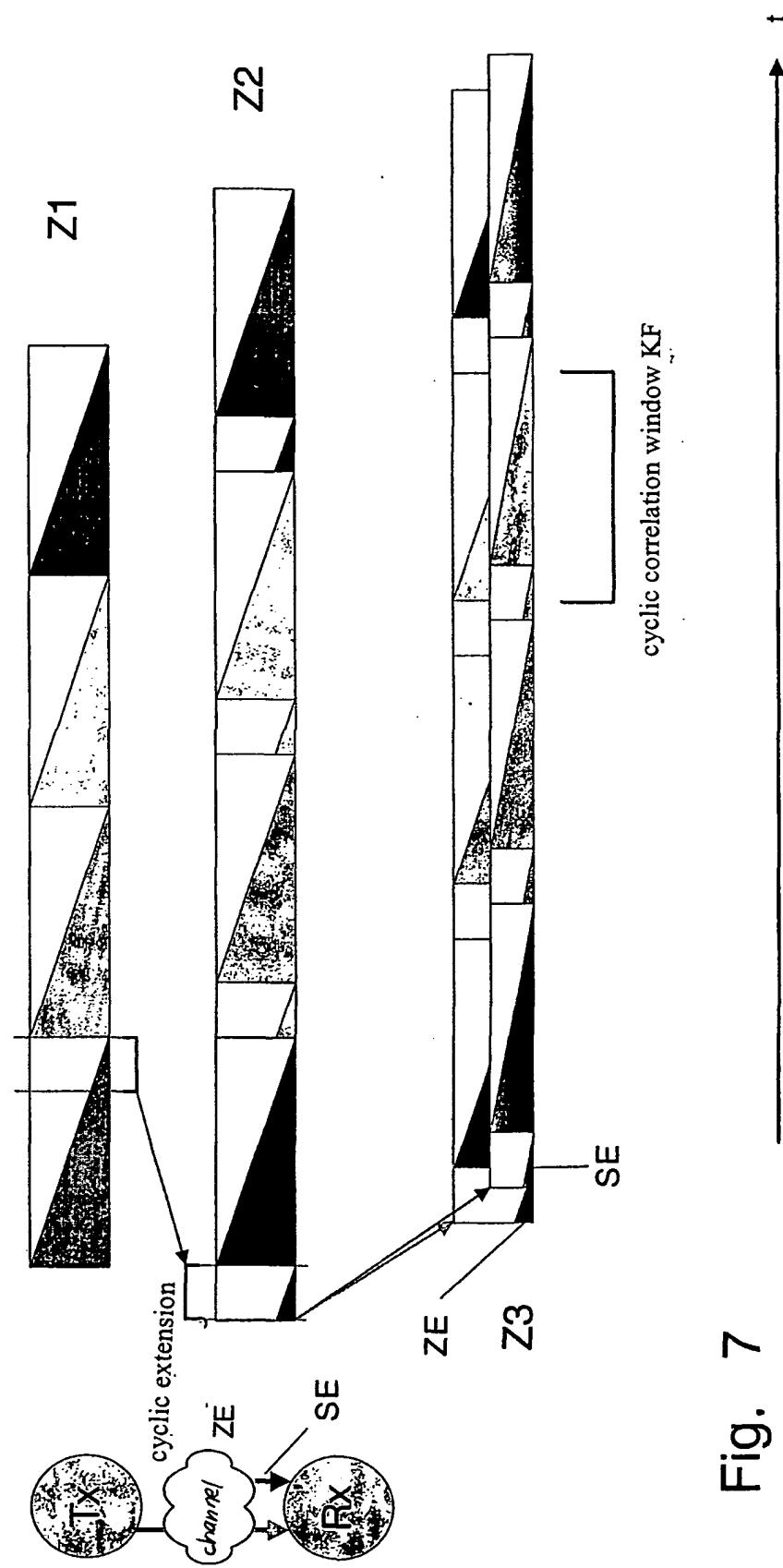


Fig. 7